Sequence stratigraphy and facies analysis of the Middle Devonian Silica Formation rocks in Sylvania, Ohio

Geology Senior Capstone
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Abstract

Strata of the Middle Devonian Silica Formation exposed at the Hansen Aggregates quarry, in Sylvania Ohio, exhibit repetitious cycles of marine sediments, influenced by local sediment supply and sea level change. Limestone and shale facies in 52.37 ft core SBH4 and hand sample, were evaluated through petrographic thin section, hydrometer shale analysis, and a detailed measured section. In the core, 18 lithofacies were identified generally coarsening upward, then transitioning into a progressive fining upward sequence. Petrographic analysis showed that hand samples correlated with the core, and exhibited evidence that angular carbonate sediments were locally derived, transitioning into coarsening upward, fine grained silty shales, deposited on the distal portions of a Prodelata lobe complex. Hydrometer analysis of shale samples, showed a coarsening upward trend in to the middle of the formation, transitioning into a fining upward sequence into the Ten Mile Creek. This represents a sequence boundary defining the transition between a marine regressive into a transgressive sequence, subdivided into 7 smaller parasequences.